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India: High Cost of High Fertility

Human fertility is a potent force which will control India's destiny during the next 30 years.

Should her high birth rate remain at its present level and her death rate continue to decline, India's population will almost double by 1986. Nearly 800 million people will live in an area about two-fifths the size of the United States.

Sheer numbers of people will have stifled economic development and thwarted that breakthrough to a better life for all envisioned by her Five-Year Plans. Rather, she will remain deeply engulfed in the morass of poverty and misery.

But should births miraculously start to decline at once and continue downward to half their present level by 1981, India's high hopes for economic development may well be realized, even though her population would increase from nearly 400 million today to about 600 million by 1986.

Should India's birth rate not begin to decline until 1966, an economic breakthrough might still be possible, but the delay would be costly in terms of postponed and more uncertain economic gains.

These three alternatives — and what they mean to India's future — are analyzed in a searching technical report recently published by the Princeton University Press. This report summarizes a unique and comprehensive study undertaken by the Office of Population Research of Princeton University with the support of the International Bank for Reconstruction and Development. It was conducted by Dr. Ansley J. Coale, Associate Professor of Economics at Princeton University and Dr. Edgar M. Hoover, Visiting Professor of Economics at Harvard University.[1]

The urgent necessity for a rapid reduction in India's birth rate is supported by considerable economic evidence. Briefly, it is difficult in an economically underdeveloped country like India to maintain a healthy balance between the need to save for investment in productive facilities on the one hand and, on the other, to meet the urgent necessity to spend for welfare and consumer goods and services, such as housing, education, health, food, clothing, etc. While outlays for productive facilities contribute directly to economic growth, outlays for welfare and consumer goods and services contribute only indirectly, if at all.

The Coale-Hoover study vividly illuminates a basic problem which plagues India and all the other overpopulated countries now striving to encourage economic development. Ultimate success is contingent upon a sharp reduction in the birth rate. Rarely in the course of history has the road to a nation's survival been so clearly defined. Will India travel it?

AGE STRUCTURE RETARDS DEVELOPMENT

A lower level of fertility creates a population age structure which is more favorable to economic development. The proportion of nonproducing dependents (ages 0-14 and 65 and over) is reduced relative to the proportion in the labor force (ages 15 to 64).

In India, the proportions of these two groups in 1956 were 42 and 58 percent, respectively. This contrasts with 35 and 65 percent in a low-birthrate country like Sweden.

According to the Coale-Hoover estimates, India's birth rate was 42.8* in 1956 and the death rate was 25.6. It is assumed that the death rate will continue to decline steadily. If fertility is cut in half between 1956 and 1981, the proportion of dependents in 1986 would be less than 35 percent and the proportion of the working age group would be 65 percent.

In numerical terms, an immediate decline in fertility would give India 175 million children under 15 in 1986 instead of 329 million (if the present level continues) and 385 million persons in the productive ages of 15 to 64 instead of 418 million.[2] Such a substantial reduction in the proportion of dependents would be an invaluable boon to an overpopulated country desperately struggling to expand its economic capacity to cope with rapidly growing numbers.

If India's birth rate continues at the present level until 1966, then falls 50 percent by 1981, her population will be more than 630 million in 1986. Even though the less favorable age distribution will greatly hamper economic growth, operation bootstrap by 1986 might still be possible.

NATIONAL INCOME DILUTED BY HIGH FERTILITY

Projecting India's national income from 1956 to 1986, on the basis of these possible population trends, the report states that "With high fertility, a smaller total product must be divided among many more consumers than would be the case under low fertility . . . A more rapid increase in the number of consumers (mostly children) is the ultimate cause of the slower rise in total output with the higher projected population trend."[3]

In making their projections, Coale and Hoover have assumed that India's high death rate will be reduced almost one-fifth by 1961, largely as a result of virtual elimination of malaria from the subcontinent. Over half of India's people live in areas where malaria is a common cause of death.[4]

India's traditionally high birth

*Birth rates, death rates and rates of natural increase are in terms of 1,000 of the population per year.

rates were until recently essential for survival because they balanced high death rates. Population grew very slowly during the centuries before the British occupied the sub-continent.

During the 50 years prior to 1921, India's population increased by about 34 million. Since 1921, growth has been explosive—136 million in 35 years.[5] At the current growth rate, 70 million will be added to the population in a decade. This does not represent maximum growth: the rate will accelerate as the death rate falls.

In this era of sanitation and public health programs, such population explosions happen in underdeveloped areas when high death rates are cut quickly—and cheaply. Birth rates tend to remain at traditionally high levels so population growth surges upward. This endangers any plans to achieve an economic breakthrough to higher living levels.

TOO MANY PEOPLE

In prehistoric times, exotic, fabulous India was a legend among the traders who walked their wares the lengths of two continents. They carried amber and other treasures from northern Europe through the routes that led to Italy, Egypt, Greece, Persia and into India, Burma and China. Then back again with their packs laden with the incense, spices and brocades of the Orient. Egypt purchased large quantities of incense, which was used for the worship of the gods, for the preparation of mummies and as medicine:

> . . . the incense made its way in heavily armed, carefully guarded caravans to the consuming countries, from oasis to oasis, from royal city to royal city. To begin with, the route taken by these caravans—a definite incense road, just as there were silk roads in Asia, and salt and amber roads in Europe—ran along the coast of southern Arabia to the west. . . .
>
> For many millennia, incense was accompanied along this road by the precious things and luxury commodities of India and the Far East. For these parts of the earth also derived their supplies of incense from Hadramat. With the monsoons, Indian traders arrived from the port of Barygaza, the modern Broach at the mouth of the River Narbada on the west coast of India. They purchased incense with teak from Further India, which was built into the palaces of the rich merchants of the Yemen, with sweet-smelling nards from the Ganges and aromatic malabathrum (cinnamon leaves) from the Himalayas, muslin-like fabrics from Taprobane (Ceylon), and silk from Cin (China), tortoise-shell from Malacca, indigo, pepper, diamonds, emeralds, sapphires, and lapis lazuli from India. From Hadramat or Aden these costly foreign things now accompanied the incense on its journey to the north, to Europe. When it finally reached its destination, it bore a 500 percent profit. And so sterile Arabia, suffocated by sand, became immeasurably wealthy; it became the *Arabia felix* of the Romans; it became the gorgeous dreamland of the Thousand and One Nights.[6]

It has been estimated that at the time of Christ there were about 100 million people within the boundaries of India. The number did not change materially for 16 centuries. When European colonies were first established in America, the Mogul empire was at its height. Then, as now, India's population appears to have been concentrated in the two most fertile areas—over

the broad Ganges Plain and in thin strips along the West Coast, south of Bombay, and in the broader coastal plain along the eastern edge of the sub-continent.

Between 1600 and 1750, population grew slowly — if at all — because high death rates checked growth. When British control of India was consolidated under Lord Clive in the 1760's, warfare and banditry were gradually reduced and this primary change in the social and political structure of the sub-continent permitted slow population growth.[7]

The first census of India was taken in 1871, a century after the *Pax Britannica* began. Then, population within the present boundaries of India was about 214 million. Between 1871 and 1921, population growth edged upward persistently, though irregularly.

Famine and plagues took a frightful toll in human life in all but two decades, 1881-1890 and 1901-1910. Population increased 34 million in those 50 years:[8]

Census Year	Population (in millions)	Average annual rate of increase between periods (in percent)
1871	214	–
1881	216	0.1
1891	236	0.9
1901	235	–
1911	249	0.6
1921	248	–
1931	270	1.0
1941	313	1.3
1951	357	1.3
1956 (Est.)	384	1.5

Since 1921, India's declining death rate has steadily accelerated population growth. In only 35 years, 136 million people were added to the population. This increment is equivalent to the combined populations of Italy, France, Poland, Sweden, Denmark and Norway.

Since 1921, population growth has accelerated rapidly, due mainly to the changing pattern of death.[9] Famine and plagues have been largely controlled. Transportation has improved so that grain can be shipped rapidly into stricken areas. The famine of World War II, most severe in areas now in East Pakistan, was limited compared with the great catastrophes of earlier decades.

Thus, India's death rate has been declining steadily since 1921. But her birth rate remains near its traditionally high level, as the following estimates indicate:[10]

VITAL RATES

Period	Birth Rate	Death Rate	Natural Increase
1881-1891	49	41	8
1891-1901	46	44	2
1901-1911	49	43	6
1911-1921	48	47	1
1921-1931	46	36	10
1931-1941	45	31	14
1951	43	31	12
1956	43	26	17

Compared with western industrial countries, India's death rate is still high. But further sharp reductions will occur as the anti-malaria and other public health programs gain momentum, and this will greatly increase the already formidable accretion of people.

India's population is now estimated to be about 400 million, with a yearly increase of almost 7 million. Unless India's birth rate starts to go down simultaneously with her death rate, the rate of growth will increase relentlessly.

TOO LITTLE LAND

India has two-fifths the land area of the United States and more than twice as many people. In fact, she has more people than the United States and the Soviet Union combined.

An agrarian, overpopulated country like India is at the mercy of the quality and extent of its crop area and of the elements. The productivity of her land is dependent on the monsoons, which govern the amount of food she can grow each year for her people.

One-third of the people are concentrated on less than six percent of the land.[11] Population distribution is largely determined by topographic and climatic factors.

The roots of the sub-continent are firmly anchored in the Himalayas, the world's highest mountain range, which walls India off from her northern neighbors. From these mountains the sub-continent's land mass of 751 million acres tumbles down in a sprawling triangle extending far into the tropics, with its tip in the steamy Indian Ocean, only 10 degrees from the equator.

The Ganges Plain, which extends north and west of Calcutta to Delhi, is one of the two most populous areas of India with a density comparable to that of the state of New Jersey. Calcutta, Lucknow and Delhi are the major cities of the region. The soils of the area are among the most productive in India and rainfall ranges from over 60 inches a year in the east to 20 inches in the west. The west is subject to severe droughts but large areas are under irrigation there.

The thin coastal strip along the west, south of Bombay, and the broader coastal plain along the east are also densely populated. Rainfall on the west coast is very heavy —averaging over 100 inches a year —and it is adequate on the east coast with a 30-inch average. The soil is fertile and irrigation is feasible with simple structures. The climate is sufficiently warm to permit extensive double-cropping. Bombay and Madras are the main cities of these strips. Population density is comparable to that of Massachusetts. The state of Kerala, south of Madras on the east coast and now under Communist local government, is the most densely settled part of India, with well over 1,000 people per square mile.

The Deccan plateau and the coastal areas northwest of Bombay city have a population density which corresponds roughly to that of Maryland. It is high and dry, with rainfall averaging from 15 to 30 inches yearly. Irrigation possibilities are relatively limited. Weak monsoons mean crop failure and great distress to this region. The main cities are Bangalore and Hyderabad.

The mountain fastness of the Himalayas, the rough areas of the central highlands and the desert of

Rajastan are India's regions of low population density. Even so, the population concentration in the region is comparable to the density of Illinois. The mountain areas include some cultivable wasteland—the only significant reserves of land in all of India—and untapped mineral reserves. The desert of Rajastan offers irrigation opportunities, the water coming from the tributaries of the Indus.[12]

Table I summarizes by regions the 1956 population, area, density, and cultivated acres per person.

MONSOON DETERMINES FOOD SUPPLY

India's climate is dominated by the summer monsoon which brings 85 percent of her welcome rainfall (average 42 inches per year) in a four-month period, June through September.[13] Coming off the ocean, the moisture-laden monsoon winds divide into two currents.

The western current strikes the Western Ghats which rise off the coastal strip to form the slopes to the Deccan plateau. This monsoon current drops up to 200 inches of rain on the coastal plain and the western slope but not much of the moist air gets through to the plateau or up the valleys of the rivers which drain the central highlands. As a result, these regions have irregular rainfall averaging 15 to 25 inches. The lower mountains north of Bombay are not high enough to extract moisture from the monsoon winds. As they blow up the Indus valley to the Himalayas, they give up practically none of their moisture to the Thar desert or to the eastern part of West Pakistan.

The eastern current of the monsoon strikes northeastern India. A branch of these winds brings to the mountains of Assam the world's record rainfall—40 feet per year in Cherripunji. Another branch of this current blows up the Ganges basin, losing its moisture on its westward course, with rainfall of 60 inches in the east to 20 inches in the west.

The southeastern part of India gets no moisture from the summer monsoon. Storms during November and December provide most of the 50 to 75 inches of rainfall a year to the area.

Irrigation agriculture is of utmost importance to India because it provides the key to any substantial increase in cropland. Over a fifth of the cultivated land is irrigated, compared to less than a

TABLE I. POPULATION DENSITY: INDIA AND THE UNITED STATES, 1956[14]

Region	Population (in millions)	Square miles (thousands)	Persons per square mile	Cultivated acres per person
High Density				
Ganges	145	219	660	0.63
Coastal	82	139	590	0.44
Medium Density	76	295	260	1.32
Low Density	81	333	240	0.92
INDIA	384	986	327	0.78
USA	168	2,975	57	2.11

tenth in the United States. From 1951 to 1956, about 15 million acres of land—the equivalent of the combined harvested cropland of the states of New York and Indiana—were put under irrigation; and about four million acres are being added each year. But with a seven million increase in population, the per capita arable land available is actually declining slightly.[15]

POPULATION TYPICAL OF UNDERDEVELOPED COUNTRY

Typical of all economically underdeveloped countries, the population of India is a youthful one with the characteristics of that youth: high birth rates and high but declining death rates; high proportion of children and young adults; still low but rapidly increasing life expectancy at birth; marriage at early age and many children born per woman. In recent years, the comparison between the populations of India and the United States in these respects is striking:[16]

	INDIA	USA
Birth rate	42.8	25.2
Death rate	25.6	9.4
Percent of population under 15 years of age	39.0	30.0
Life expectancy at birth (in years)	38	69.5
Percent single		
Males:		
15-44 years old (%)	26.7	35.3
45 and over	3.5	8.5
Females:		
15-44 years old (%)	8.2	25.1
45 and over	1.1	8.2

Large families are traditional in India. According to official Indian estimates, 42 percent of the children born in 1950 were accounted for by the fourth or higher order of child ever born to the mother. First, second and third children comprised only 58 percent of the births. In the United States, first, second and third children accounted for 74 percent of the babies born in 1955.

PERCENTAGE OF BIRTHS BY ORDER[17]

	1st	2nd	3rd	4th and over
United States	28	27	19	26
India	22	20	16	42

Large families and inadequate housing produce congested living conditions. The average household group in India had 4.9 members in 1951, the same as the average in the United States in 1890. The average household group in this country had 3.4 members in 1950.[18]

THE CURSE OF PERVASIVE POVERTY

Like most other underdeveloped countries, the roots of India's endemic poverty lie in the fact that she is an agrarian country by tradition and culture. Yet she is unable to raise enough food for her rapidly growing population. By modern standards, India's agriculture is overcrowded with workers, unproductive, inefficient, primitive. She has relatively few industrial opportunities with which to siphon workers off the land.

Another great problem of Indian agriculture is the large number of people dependent upon it. In 1901, in the area corresponding to the Union of India, there were 146 million people dependent upon agriculture out of a total population of 235 million; in 1951, 250 million

out of 357 million. In other words, there has been an increase of more than 100 million in the agricultural population without any substantial increase in cultivated land.[19] Is it surprising, then, that agricultural conditions are much worse now than they were at the beginning of the century?

It is this increasing pressure of population upon the soil and the growing indebtedness of the farmers that have caused the emergence of a class of landless laborers and tenants. In 1901, they and their families included only 20 million persons; in 1951, they totalled 76 million, more than a fifth of the population. It is these people who are receptive to any political philosophy that offers them hope. They are pawns in the hands of all kinds of demagogues.

Many people seem to think that mechanization of agriculture would be a panacea for the ills of India. Nothing could be further from the truth. Mechanization results in producing a higher yield per man employed, not a higher yield per acre cultivated. Mechanization is essential, therefore, in such countries as the United States, where labor is relatively scarce and expensive. In India the conditions are just the reverse. There is a plethora of labor and a lack of employment. The great majority of the farmers are unemployed or under-employed for three or four months out of the year as things now stand. Application of even the simplest mechanical methods would force out of work at least half of the population supported by agriculture in 1951. To find alternative work for such a mass of people would be beyond the power of any government.

This rural unemployment and under-employment are due partly to the seasonal character of the rainfall. Most places in India have an adequate, or more than adequate, amount of rain in a normal year, but it falls mainly in the summer months; droughts during the remainder of the year are a recurring hazard for the farmers.

One glance at the industrial breakdown of India's labor force emphasizes the grip of necessity on her economy, especially in contrast to the occupational structure of the labor force of a western industrialized nation.

Roughly speaking, the percentage

TABLE II. PERCENTAGE BREAKDOWN OF LABOR FORCE[20]

	India (1951)	United States (1950)
Agriculture, forestry, hunting and fishing	70.6	12.2
Mining and Manufacturing	9.6	28.5
Construction	1.1	6.2
Electricity, gas, water and sanitary services	0.5	1.3
Commerce	5.8	18.5
Transport, storage, and communication	1.9	7.0
Services	10.6	22.1
Not classifiable elsewhere	. . .	4.3
Total	100.0	100.0

of workers in agriculture indicates the proportion of workers employed merely to feed the population. The percentage in mining and manufacturing shows the extent of industrialization. The percentage of workers in services reflects the contrasting levels at which two countries indulge in the amenities and luxuries of life—the difference between poverty and affluence. In the United States, a much higher percentage of the labor force is engaged in providing medical, health, and educational services and entertainment and recreation.

India's limited industrialization helps to keep her per capita income among the world's lowest, $59 per year in 1956. This compared with over $2,000 in the United States.[21]

Based on the number of workers employed in industry, India is among the world's 10 leading industrial nations. Nevertheless, because of her large population, her per capita output is extremely small. Textiles, jute and sugar processing are her main industries. India has great hope for her small but thriving iron and steel industry because rich iron and coal reserves are available.

BUILT-IN BARRIERS TO DEVELOPMENT

Certain social factors with their roots in India's age-old poverty block rapid economic development. High illiteracy, the caste system and religious and language differences all impede progress. To illustrate, 782 Indian languages and dialects and 63 non-Indian languages were listed in the 1951 census. Only about one-third of the population speaks Hindi, the official and the most common language. There has been a cultural rebellion against English since independence, but through necessity it remains the language of diplomacy and government.

Table III presents a few social and economic indicators in India and in the United States. These serve to give a measure of economic development in the two countries.

THE FIRST FIVE-YEAR PLAN

In 1951, the First Five-Year Plan was launched to attack the pressing, inter-related problems of low agricultural and industrial out-

TABLE III. ECONOMIC AND CULTURAL INDICES: INDIA AND THE UNITED STATES, ABOUT 1956[22]

	India	United States
Cultivated acres in millions	296	355
Irrigated acres in millions	67	32
Percent of population illiterate	82	2.5
Male	70	3.0
Female	91	2.1
Percent of children in primary school	51 (6-11 yrs.)	99.3 (7-13 yrs.)
Inhabitants per physician	5,700 (1952)	760 (1953
Steel production in million tons	1.7	106.2
Coal production in million tons	38	529
Cement in million tons	4.3	48
Installed electric capacity in million kw	3.4	119
Annual national income in billions	$22.7	$ 344.
Annual per capita income (in U.S. Dollars)	$59.	$2059.

put, illiteracy, ill health, inadequate housing—all those problems which are keeping India mired in poverty. The most immediate need was to relieve the serious food shortage. Therefore, the First Plan laid heavy stress on agricultural improvements, such as irrigation, reclamation of waste land and forests, rural extension work, etc. About one-third of the total expenditures of $5 billion went for these purposes. The Indian Government assumed half of the total cost of the Plan ($10 billion) and the balance was financed privately, with industry constructing factories, steel mills, and many other facilities.[23]

The results of the First Five-Year Plan were gratifying in many respects. Agricultural production went up 19 percent. Favorable monsoons were an important factor in this increase. The area under crops increased by 26 million acres. Rural development and extension programs had reached into almost one-fourth of India's villages. Industrial output rose 22 percent, mainly through use of existing capacity, and a beginning was made to diversify industry and to encourage small factories.[24]

Impressive though these gains are, they did not begin to catch up with the need of India's 1951 population of 357 million. By 1956, the final year of the Plan, India had 27 million more people to feed, clothe, house and educate than she had at the beginning.

THE SECOND FIVE-YEAR PLAN

India's population was estimated to be 384 million in 1956, when the Second Five-Year Plan was launched. This new plan recommended a $10 billion appropriation by the Government, plus $5 billion by private sources. Expansion of industry, mining and transportation was emphasized.[25]

Two unexpected difficulties have impeded progress of this Plan. Poor harvests have aggravated India's food problem, and problems with foreign exchange have multiplied. Although India has a good supply of pound credit, she does not have the dollars, Deutsche marks, kroners, rubles, etc., with which to buy industrial equipment, grain and other necessities outside the sterling area. As matters now stand, India must seek $1.5 billion in loans and assistance from other countries during the next three years to keep the Plan in operation.

Will India achieve her goal of

TABLE IV. ALLOCATION OF GOVERNMENT FUNDS IN INDIA'S FIRST AND SECOND FIVE-YEAR PLANS IN U. S. DOLLARS[26]

	First Plan		*Second Plan*	
	$ Billion	Percent	$ Billion	Percent
Agriculture	0.75	15	1.19	12
Irrigation and Power	1.39	28	1.92	19
Industry and Mining	0.38	8	1.87	18
Transport and Communication	1.17	24	2.90	29
Social Services	1.12	23	1.99	20
Miscellaneous	0.14	3	0.21	2
TOTAL	4.95		10.08	

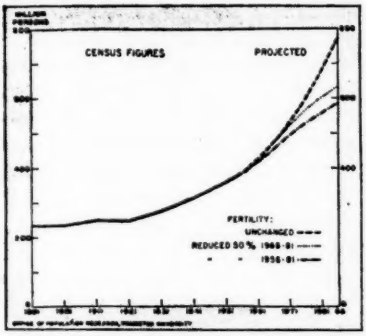

FIGURE 1: INDIA'S POPULATION GROWTH

Since 1891, India's population has increased from 236 million to nearly 400 million. Projections for the succeeding thirty years are shown from the Coale-Hoover study.

guiding the country over the threshold from an underdeveloped, stagnant economy to a developing one with self-sustaining growth which is fed on internally-generated savings and investment? Will India achieve her hope and double her per capita income in the next 20 years?[27]

COMPARING THE TWO PLANS

The allocation of Government funds in the first two Plans is shown in Table IV.

The first Plan had allocated $1.3 million to family limitation and population control. It is significant that the need to control population growth was officially recognized as an essential element in curing India's pervasive poverty. But considering the size of the problem, hardly a dent could be made in it with so small an amount.

Not much fiscal information is available on the Second Five-Year Plan. The total allocation for family planning and population control was approximately $10 million.

In contrast, during the present fiscal year ending in March 1959, $14 million has been allocated for malaria control projects alone. At that rate, this one health project would spend in one year more than the total amount allocated to fertility control.

Such a disparity suggests that India is taking an aggressive approach to further reduction of deaths but a limited, timid approach to the reduction of births. The warning sounded in the First Five-Year Plan that the economic fate of India depends on her success in quickly achieving a balance between deaths and births seems to have lost its urgency.

THE COALE-HOOVER REPORT

The report of Dr. Ansley J. Coale, demographer, and Dr. Edgar M. Hoover, economist, is a provocative truth-and-consequences analysis of what the future holds for India's teeming millions.

The report leaves the reader with the impression that continued high fertility will lead India to economic suicide. It tempers this gloomy prospect with the hopeful conclusion that India does have a brief period of grace to put her demographic house in order. If this period is not exploited aggressively, prospects for a good life are gloomy.

Through the construction of economic and demographic models, three possibilities are presented to show how the Indian economy and

population may look in 1986, depending on the level of India's fertility in the intervening years. In each, it is assumed that the death rate will decline by more than 40 percent by 1986.

Model I assumes that fertility begins to decline immediately and continues down to half its present level by 1981.

Model II assumes no change in fertility until 1966, and then a decline so sharp that fertility is cut in half by 1981.

Model III assumes that fertility will remain at the present level until 1986.

The analysis includes such items as national income available for investment in productive facilities; needs for housing, social services, schooling, and other welfare expenditures; and the proportion of labor force in the total population. It does not take into account certain intangible gains such as increased vigor of the population due to better living conditions under conditions of slower population growth.

Under Model I, with an immediate decline in the birth rate, the population will grow to 589 million by 1986. Since there is no immediate prospect of an effective massive attack on the Indian birth rate, this model is mainly of theoretical interest. It does serve to underline impressively how important the level of fertility is to a nation devoted to achieving an economic breakthrough. If India's birth rate miraculously started to decline in

TABLE V. PROJECTIONS OF POPULATION AND NATIONAL INCOME INDIA, 1956-1986[28]

	1956	*1961*	*1966*	*1971*	*1976*	*1981*	*1986*
Coale-Hoover projections:							
Model I (Low projection)							
Population (millions)	384	420	458	496	531	562	589
Income per equivalent consumer 1956 = 100	100	108	117	128	143	165	195
Percent National Income invested	7.0	8.1	9.1	10.4	11.8	13.3	14.7
Model II (Medium projection)							
Population (millions)	384	424	473	524	569	603	634
Income per equivalent consumer 1956 = 100	100	107	114	121	131	148	170
Percent National Income invested	7.0	7.7	8.4	9.6	10.7	12.2	13.5
Model III (High projection)							
Population (millions)	384	424	473	532	601	682	775
Income per equivalent consumer 1956 = 100	100	107	114	120	126	132	138
Percent National Income invested	7.0	7.7	8.4	8.9	9.4	9.9	10.1
Gopalaswami projections:							
High		406		465		529	
Low		403		454		523	

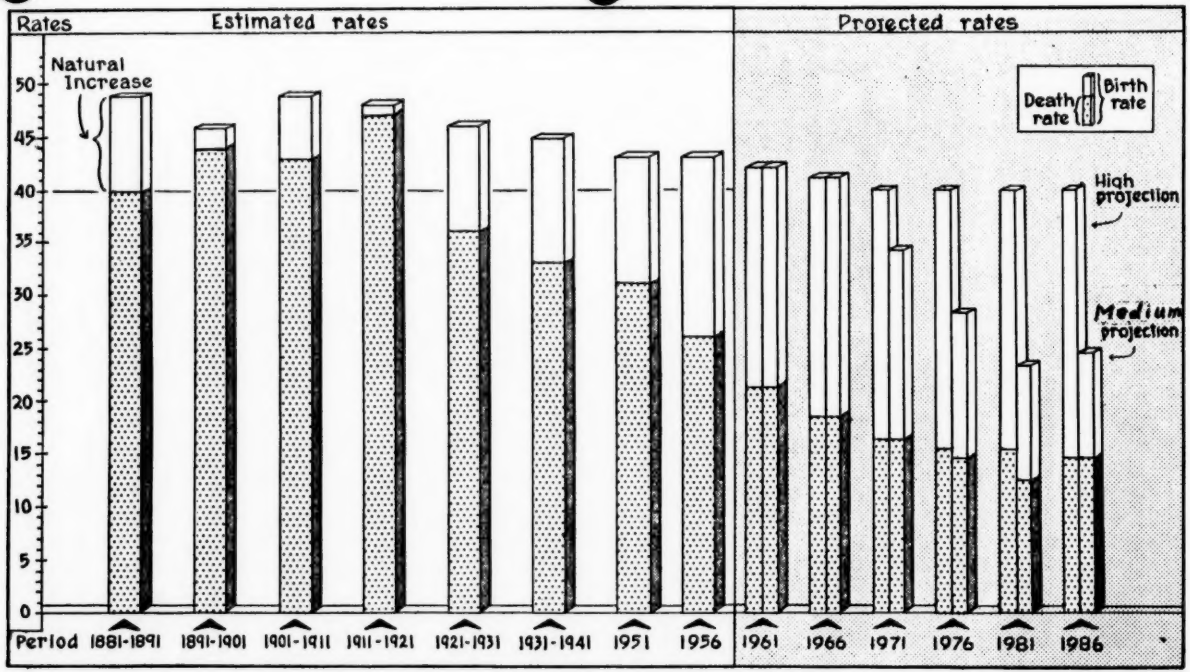

FIGURE 2: THIRTY YEARS' PROJECTED GROWTH RATES[29]

Prior to 1921, India's population grew irregularly. Since 1921, the rate of growth has increased in each decade. This acceleration will relentlessly increase unless the birth rate is brought into balance with declining mortality. The Coale-Hoover projections for high fertility (Model III) and for medium fertility (Model II) are presented here to 1986. This assumes no change in the birth rate until 1966.

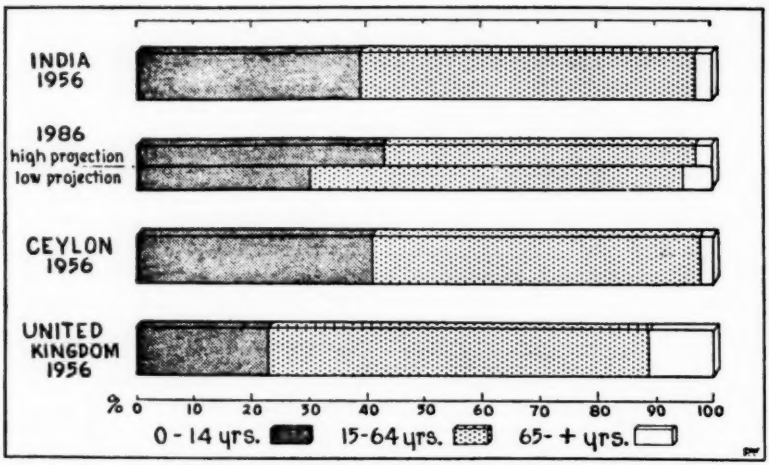

FIGURE 3: TRENDS IN AGE DISTRIBUTION[30]

The present age distribution of the population of India is compared with the high and low projections for 1986 made in the Coale-Hoover report. The striking reduction in the proportion of non-productive ages under reduced fertility is shown in comparison with the situation in Ceylon, where a sharp break in the death rate occurred in 1947, and with the United Kingdom, where growth has been virtually stabilized at a low birth rate and a low death rate.

1959, her economy and the welfare of her people would be far more advanced in 1986 than under either of the other possibilities. The key to the welfare of India's people clearly lies in the speed and effectiveness with which her fertility can be reduced.

Under existing conditions, there is a definite possibility that Model II might be achieved. If the birth rate should begin to drop sharply after 1966, the population would grow to 634 million by 1986.

Under Model III, with the birth rate remaining at its present level, a population of 775 million is the prospect for 1986. That is nearly double the present population.[31]

Coale and Hoover find that continuing high fertility would present a major barrier to an economic breakthrough. The proportion of children under 15 in 1986 would be so high (42 percent, compared with 30 percent for the low projection) as to constitute a decisive handicap to economic development.

By that time, only 10.1 percent of India's national income would be available for productive investment with almost twice as many people, each year a larger proportion of capital would be diverted for essential social services, such as health and education and for non-productive investment, such as housing. In contrast, under the low-fertility pattern of Model I, 14.7 percent of the national income would be available for productive investment.

The difference between 10.1 percent and 14.7 percent of the national income may not seem impressive. But in a nation struggling to emerge from a marginal agrarian culture it may well mean the difference between victory and defeat in the battle for economic self-sufficiency. It would be adequate to provide a gradual improvement of living levels.

PROJECTIONS OF POPULATION GROWTH

Table V shows population projections to 1986 under each of these Models, in five-year periods; also high and low projections of population made in 1951 by the Registrar General of India, Mr. R. A. Gopalaswami. These are included to suggest that the Indians themselves may be underestimating future population growth.

Mr. Gopalaswami's estimates were based on past population growth: the low growth equal to the average rate of the three decades 1921-51; the high growth rate equal to the decade 1941-51. Those estimates would be greatly exceeded if India's death rate falls in the next decade—and surely it will as a result of the campaign to wipe out malaria—while the birth rate remains at the present high level. If the welfare of the individual is to be enhanced, the economy must develop fast enough to support such an increase. Dr. Frank Notestein, Director of the Office of Population Research at Princeton University, has written these words concerning population growth in various areas of the world, and they are applicable to India today:

> Sustained population growth, even at a relatively low rate, is not possible for any period of time significant in the history of the human race. In principle, there must come a time at which low death rates could not be maintained without comparable low birth rates. This is an inexorable fact of nature . . . death rates must rise or birth rates must fall.[32]

It should be stressed that the Coale-Hoover projections are not intended to be predictions of what will actually happen. Their purpose is to indicate the general trend of events if different rates of population increase occur by reason of continuing or changing levels of fertility. The gloomy outlook if fertility is not reduced soon, and quite drastically, is lent substance by the difficulties India is even now experiencing in obtaining capital to implement the Second Five Year Plan.

So precarious is the economic situation of the country that India can scarcely afford many more years of high fertility. With a slow growth of national income and a growing burden of population, the effort to break the vicious cycle of poverty and overpopulation will become much more difficult with each passing year.

The difference which the rate of population growth will make is illustrated by the need for additional funds for education and housing if the high-fertility course of population growth occurs. The difference between the population of the high and the low projections in 1986 is estimated to be 186 million, *of which 154 million would be*

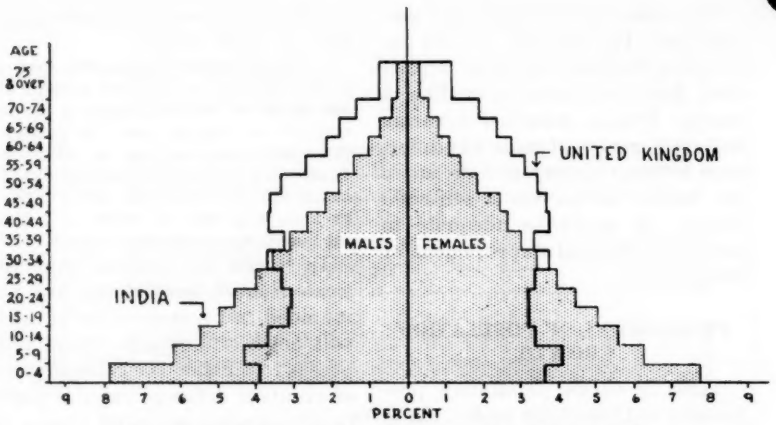

FIGURE 4: HIGH AND LOW-FERTILITY AGE STRUCTURE[33]

The United Kingdom went through its demographic transition during the nineteenth century and today has a virtually stable population. India with a population of 400 million is only just entering the era of transition. The leisurely transition of the nineteenth century in the Western world was accompanied by at least a tripling in population. With India's large base, there is urgent need for a very rapid reduction in the birth rate.

children under 15 and only 32 million would be 15 years of age and over. In 1956, only about three-eighths of the children 6-14 years of age were in school.

To provide even minimal universal primary education from 1981 to 1986 would cost an estimated $4 to $5 billion more if high fertility continues than if fertility begins to decline immediately, as under Model I. The estimated increased cost of providing housing for the additional population under the high-fertility assumption, taking into account urbanization trends, is estimated to be more than $8 billion over the 30-year period 1956-86.[34]

ATTITUDE OF THE INDIAN GOVERNMENT

When reviewing India's two Five-Year Plans, the Registrar General's Report of the Indian Census and other official documents, it seems crystal clear that the Indian government recognizes the need for a policy designed to stabilize population growth. Its attitude is liberal, constructive and —to use Aldous Huxley's words— "less superstitious" than that of most western governments. The Second Five-Year Plan noted that:

> Given the over-all shortage of land and of capital equipment relatively to population as in India the conclusion is inescapable that an effective curb on population growth is an important condition for rapid improvement in incomes and in levels of living. This is particularly so, if one bears in mind the fact that the effect of improvements in public health and in the control of diseases and epidemics is to bring about an almost immediate increase in survival rates. While there may be differences as to the

likely rates of population growth over the next 20 to 25 years, indications clearly are that even with the utmost effort which can be made—has to be made—at this stage to bring down birth-rates, population pressure is likely to become more acute in the coming years. This highlights the need for a large and active programme aimed at restraining population growth, even as it reinforces the case for a massive development effort.[35]

At the action level, the Indian government's approach has been more cautious. Development of an effective population policy takes time for discussion and study. *But how much time does India have?* The Coale-Hoover report emphasizes the urgent need for India to implement such a policy at the earliest possible moment.

There is indication that the problem so portentous for India's future welfare is being attacked with little of the sense of urgency that the situation makes imperative. The $1.3 million allocated for family planning in the First Five-Year Plan was less than one percent of the total provided for medical and public health services. Even so, only about 75 percent of the funds were actually spent. An encouraging start was made, by the central government and by other agencies. State and local authorities, private organizations and scientific groups activated 115 family planning clinics; and 19 research projects in related biological and demographic problems were also supported.

While it is true that the Second Plan allocated $10 million to family planning—a substantial increase—this is still less than two percent of the amount earmarked for medical and health programs. A Family Planning Board was established within the Ministry of Health in 1956 as an advisory group to determine policies and specific programs, and to review and evaluate progress.

This Board directs the program which aims to incorporate family planning units in each of the 2,000 primary community health centers in rural areas and in some 500 centers in the cities. Two training centers have already been set up—the All-India Institute of Family Planning in Bombay, which emphasizes training for urban areas, and a second near Bangalore for rural areas. Two field studies already begun near Delhi and Calcutta are experimenting with contraceptive methods and the best ways of providing family planning service. A Demographic Research and Training Center has been established in Bombay. This is sponsored by the Government of India and the United Nations to serve not only India but also other countries of Asia. It is financed jointly by the Indian Government and the United Nations, with some help from the Population Council, a private organization in the United States.

So far, only a small beginning has been made toward mounting a realistic program to cope with India's rampant fertility. Each year that passes, the need for a really aggressive program becomes more acute. The Second Plan's allotment of $10 million over a five-year peri-

od will hardly make a dent in India's high birth rate.

It cannot be too strongly emphasized that $14 million for malaria control in one year alone is bound to reduce the death rate, barring an unexpected catastrophe. And this is only *one* health program representing a fraction of the total health plan.

THE CHALLENGE OF THE CENTURY

The underdeveloped, overpopulated countries of the world are caught in a demographic squeeze as a result of the ever-increasing efficiency in controlling death rates. When this is considered in the context of the East-West struggle for leadership in Asia and Africa, the demographic dilemma of the agrarian countries has an added and sinister significance.

India's predicament is typical. Cultural mores are attuned to an earlier time when high mortality made all-out fertility essential. A low level of literacy tends to conserve these mores and prevent a rapid change in reproductive patterns. So the rapid decline in death rates ruthlessly accelerates the rate of population growth.

The Coale-Hoover economic models are both reassuring and alarming. A period of grace still exists for India, but the time is short. If she is able to cope with her dangerously high fertility during the next generation, all need not be lost. Theoretically, food production can be increased to provide for the increment in people and the economy might even afford a slight advance in living levels. But every year that no effective attack is mounted against high fertility moves India one year nearer the demographic point of no return, when the rising tide of people swamps economic improvement.

The Coale-Hoover report suggests that India's period of grace is no more than a generation. Can she possibly re-orient the reproductive pattern of her teeming millions to the small family in so short a time? That is the challenge for India and her people. It is also the challenge for Asia.

In Japan and China, motivations to control growth seem to have been stronger than they are in India. Japan has so effectively applied brakes to her birth rate that her population is expected to stabilize by 1980. Abortion has been the major method used. Officially, abortion is no more acceptable in India than it is in the West. But recent statistics seem to indicate that it is on the increase in both areas.

Recent attitude studies indicate that contraceptives are acceptable in India, and that a sense of urgency concerning the need to check high fertility *can* be developed among the people in the Indian villages.

History records several cases which prove conclusively that motivations will be strong enough to reduce birth rates and check population growth when a demographic awakening comes, even in cultures with a low level of literacy. This happened in France a generation

before the French Revolution. It happened during the first half of the nineteenth century in Ireland. Now, under entirely different conditions, it is happening in Italy, in Japan and in Puerto Rico.

The leadership of Asia in the years ahead could go to that nation which first comes to grips with the dilemma of too-rapid population growth. No other advance would give so great an impetus to economic development.

ROBERT C. COOK, *Editor*

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